

- NOTES**
- HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 10, NAD83, IN US SURVEY FEET, BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83(CORS) 2003.00 EPOCH VALUES OF NGS CORS STATIONS: "PLATINUM_AK 2007 CORS ARP" (AB12 - PID DL6672) AS N 1,808,542.08, W 1,688,330.95 (ALASKA STATE PLANE, ZONE 7, NAD 83); "SAND POINT_AK 2004 CORS ARP" (AB07 - PID DL7635) AS N 496,192.78, W 1,957,402.96 (ALASKA STATE PLANE, ZONE 7, NAD 83); AND "PORT HEIDEN AK 2007 CORS ARP" (AC40 - PID DL6447) AS N 1,070,797.95, W 1,516,871.31 (ALASKA STATE PLANE, ZONE 6, NAD 83). CORS STATIONS STATE PLANE COORDINATES ARE CONVERTED FROM LAT/LONG USING NGS PROGRAM SPCR38(2,1). RESULTANT COORDINATES AT PRIMARY HARBOR CONTROL HOLD DOMED BC "IC-1, 2002" AS N 1,185,550.28, E 5,316,753.29 AND DOMED BC "UH-1, 2010" AS N 1,180,372.71, E 5,313,655.82.
 - VERTICAL CONTROL IS IN FEET, REFERRING TO MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NGS TIDAL BENCH MARK LIST: "9462620, UNALASKA, DUTCH HARBOR, ALASKA, PUBLISHED 04/21/03." THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING TIDAL BENCHMARK USCGS SBC "NO. 19 1973" AS 16.42'. ALSO PROVIDED ARE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS, BASED ON HOLDING THE PUBLISHED VERTICAL VALUE FOR TIDAL BENCHMARK USCGS SBC "NO. 19 1973" (PID BBBB51) AS 23.91'.
 - SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.
 - SURVEY WAS CONDUCTED ON AUGUST 11-16, 2010. SOUNDINGS WERE COLLECTED USING AN ODOM ESS MULTI-BEAM DEPTH SOUNDER (200KHZ, 120-DEGREE SWATH-WIDTH WITH 240, 0.75 DEGREE BEAMS), SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODOM DIGI-BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUNDER HEAD USING AN ODOM DIGI-BAR V. POSITIONING AND TIDES WERE PROVIDED IN REAL TIME USING A TRIMBLE 461 RTK GPS RECEIVER OPERATING ON KINEMATIC CORRECTORS BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, "IC-1, 2002". VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPACK 2010 INTEGRATED SOFTWARE.
 - THIS SURVEY WAS CONDUCTED BY HUGHES AND ASSOCIATES, WASILLA, AK.

CONTROL DATA

| STATION | NORTHING | EASTING | MLLW | NAVD88 | DESCRIPTION |
|-----------------|--------------|--------------|-------|--------|-------------------------|
| GRAVE 1901-35 | 1,183,502.41 | 5,320,202.41 | 59.69 | 67.18 | USCGS SBC (TRI STA) |
| NO. 19, 1973 | 1,183,685.10 | 5,317,889.85 | 16.42 | 23.91 | USCGS SBC (BENCH MARK) |
| 2620M, 1982 | 1,184,130.08 | 5,317,058.63 | 10.97 | 18.45 | NOS SBC |
| 2620M, 1990 | | | | 11.81 | NOS SBC |
| IC-1, 2002 | 1,185,550.28 | 5,316,753.29 | 14.60 | 22.08 | 3.25" DOMED BC |
| IC-2, 2006 | 1,184,659.58 | 5,316,533.53 | 7.43 | 14.91 | 3.25" DOMED BC IN ROCK |
| IC-3, 2006 | 1,183,334.86 | 5,319,086.52 | 16.02 | 23.50 | 3.25" DOMED BC IN CONC. |
| ARGENTINA, 1994 | 1,180,828.37 | 5,312,893.00 | 33.58 | 41.07 | 2" AL CAP |
| UH-1, 2010* | 1,180,372.71 | 5,313,655.82 | 10.93 | 18.41 | 3.25" DOMED BC IN ROCK |
| UH-2, 2010* | 1,180,603.19 | 5,313,280.70 | 11.04 | 18.53 | 3.25" DOMED BC IN ROCK |

NOTE: UH-1, 2010 AND UH-2, 2010 WERE SET THIS SURVEY.

PROJECT LIMITS

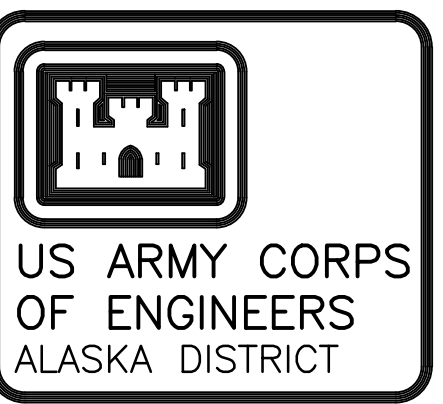
| CORNER | NORTHING | EASTING | CORNER | NORTHING | EASTING |
|--------|--------------|--------------|--------|--------------|--------------|
| 1 | 1,184,672.87 | 5,317,588.33 | 3 | 1,184,872.40 | 5,316,534.03 |
| 2 | 1,184,401.44 | 5,317,357.95 | 4 | 1,185,132.08 | 5,316,784.98 |

NAVIGATION AIDS

| DESCRIPTION | USCG NO. | NORTHING | EASTING |
|--|----------|-----------|-----------|
| UNALASKA CHANNEL LIGHTED BUOY 5 (FL GREEN) | 27470 | 1,184,461 | 5,317,357 |
| ILIULIUK REEF LIGHTED BUOY 6 (FL RED) | 27475 | 1,184,732 | 5,317,559 |
| ENTRANCE BUOY 8 (RED NUN) | 27480 | 1,184,973 | 5,317,009 |

VOLUME COMPUTATIONS

| PROJECT DEPTH -25.0' | |
|---|----------|
| AVAILABLE TO PROJECT DEPTH (-25.0') | 2,613 cy |
| AVAILABLE BETWEEN PROJECT DEPTH (-25.0') AND MAX PAY DEPTH (-26.0') | 1,136 cy |
| AVAILABLE ALONG SIDE SLOPES | 909 cy |
| TOTAL MATERIAL AVAILABLE | 4,658 cy |



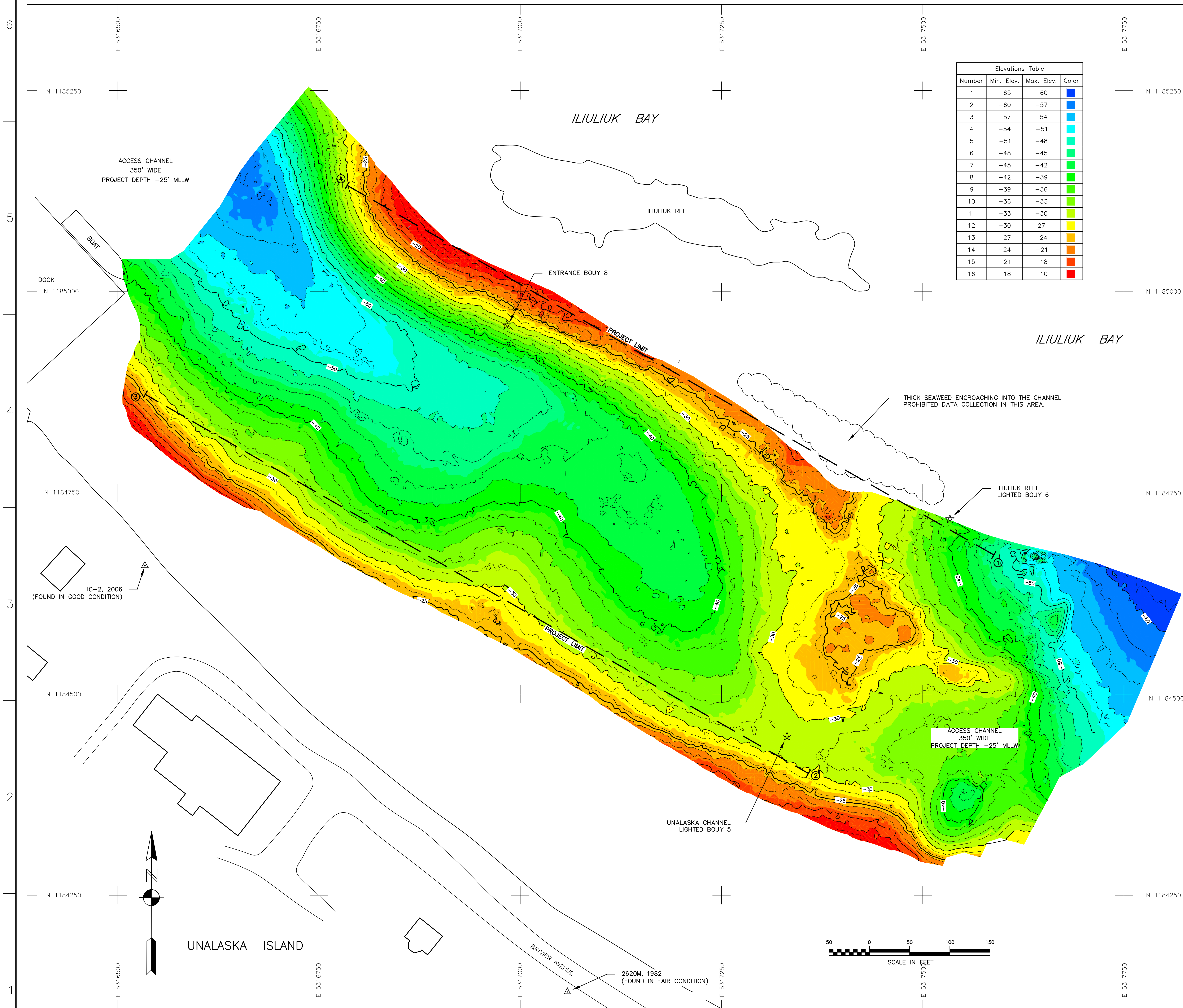
CONTRACT NO. W911KB-10-D-0005
 CONTRACTOR HUGHES AND ASSOCIATES
 CITY WASILLA STATE AK
 Approved: _____ Date: _____
 Recommended: _____
 PRIME CONTRACTOR RESIDENT ENGINEER

| Sheet Action | Description | Date (Appr) |
|--------------|-------------|-------------|
| | | |

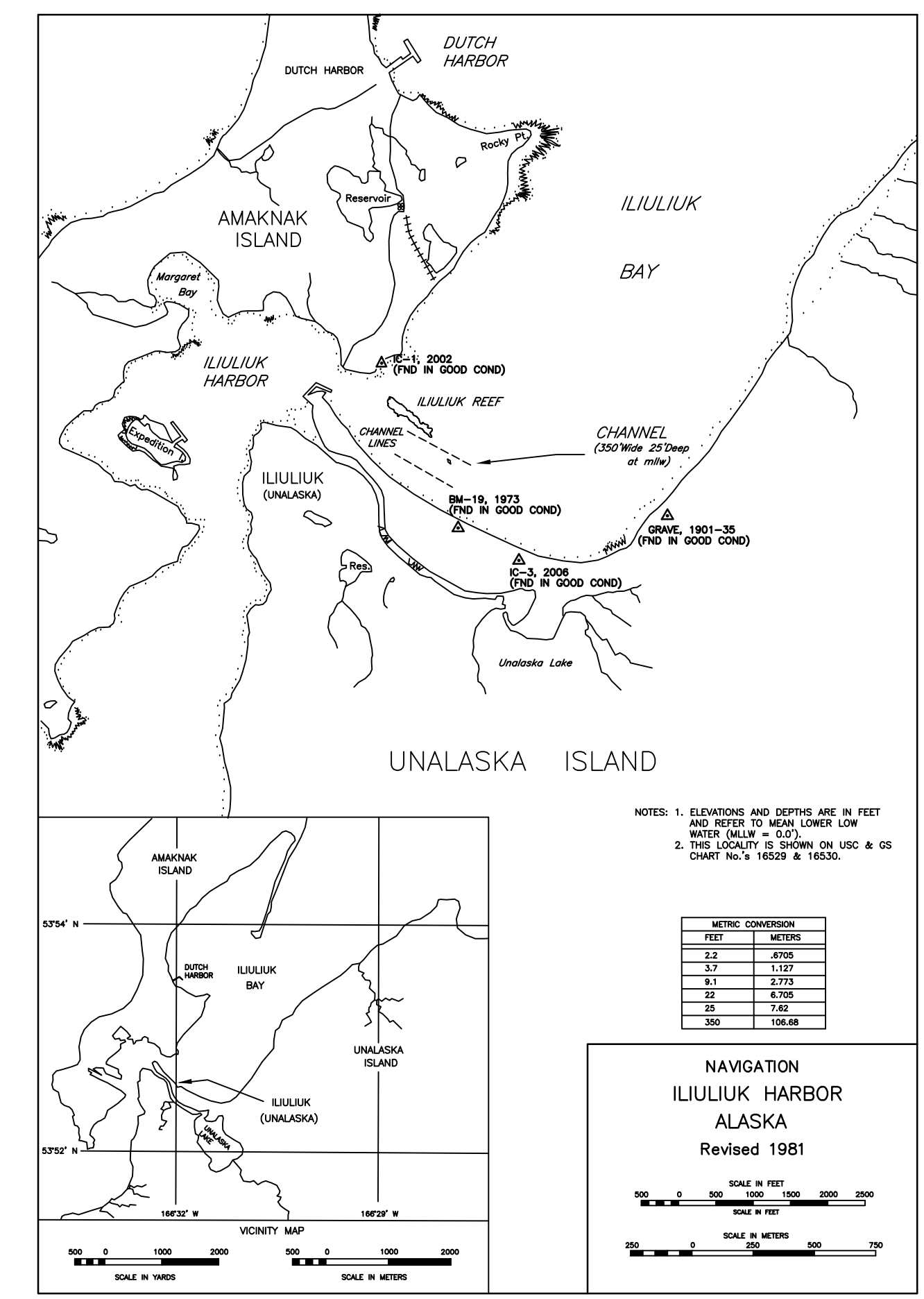
Date: 9/21/10
 Drawn: TNL
 Reviewed: CSH
 Submitted: CSH
 Checked: CSH
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 ANCHORAGE, ALASKA
 2816-10

UNALASKA, ALASKA
 ILIULIUK CHANNEL
 CONDITION SURVEY
 AUGUST 11-16, 2010

Reference number:
V-101
 Sheet 1 of 2



| Number | Min. Elev. | Max. Elev. | Color |
|--------|------------|------------|--------|
| 1 | -65 | -60 | Blue |
| 2 | -60 | -57 | Blue |
| 3 | -57 | -54 | Blue |
| 4 | -54 | -51 | Cyan |
| 5 | -51 | -48 | Cyan |
| 6 | -48 | -45 | Green |
| 7 | -45 | -42 | Green |
| 8 | -42 | -39 | Green |
| 9 | -39 | -36 | Green |
| 10 | -36 | -33 | Yellow |
| 11 | -33 | -30 | Yellow |
| 12 | -30 | -27 | Yellow |
| 13 | -27 | -24 | Orange |
| 14 | -24 | -21 | Orange |
| 15 | -21 | -18 | Red |
| 16 | -18 | -10 | Red |



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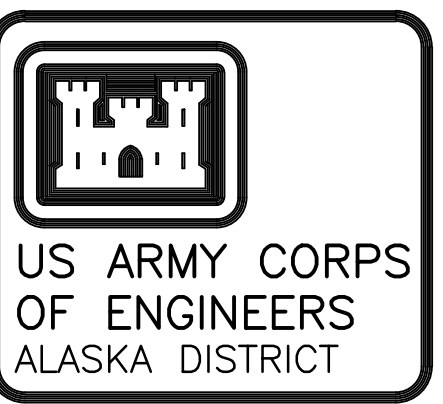
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 CITY WASILLA STATE AK
 Recommended: _____ Approved: _____
 PRIME CONTRACTOR RESIDENT ENGINEER

| Date | Description | Appr'd |
|------|-------------|--------|
| | | |
| | | |
| | | |
| | | |

Date: 9/21/10
 Drawn: TNL
 Reviewed: CSH
 Submitted: CSH
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 ANCHORAGE, ALASKA
 2816-10

UNALASKA, ALASKA
 ILIULIUK CHANNEL
 CONDITION SURVEY
 AUGUST 11-16, 2010

Reference number:
V-701
 Sheet 2 of 2